CLAIMS

1. A mobile communication system comprising a wireless apparatus including multipath timing detecting means for detecting multipath timings in a received signal using a known signal, characterized in that the wireless apparatus comprises:

channel vector estimating means for estimating channel vectors according to the multipath timings detected by the multipath timing detecting means; channel matrix generating means for arranging the channel vectors estimated by the channel vector estimating means, in a preset method according to the multipath timings, to thereby generate a Channel matrix; weight calculating means for calculating a filter weight using the Channel matrix generated by the Channel matrix generating means, and one ore more equalizers for equalizing the received signals using the filter weight calculated by the weight calculating means.

2. A mobile communication system in accordance with claim 1, characterized in that:

the channel vector estimating means estimates channel vectors at the multipath timings and a number of channel vectors in the neighborhood of the multipath timings; and

the channel matrix generating means generates the Channel matrix using the channel vectors at the multipath timings and the number of channel vectors in the neighborhood of the multipath timings.

3. A mobile communication system comprising a wireless apparatus including one or more equalizers for equalizing received signals, characterized in that the wireless apparatus comprises:

channel state estimating means for estimating a channel state

according to the received signals, judging means for judging, according to the channel state estimated by the channel state estimating means, whether equalization by each equalizer is required for a channel condition; and selecting means for operating each equalizer to equalize the received signals if the judging means determines that the equalization by each equalizer is required for the channel condition, and suppressing the equalization for the received signals if the judging means determines that the equalization by each equalizer is not required for the channel condition.

4. A mobile communication system in accordance with claim 3, characterized in that:

the channel state estimating means estimates at least one of a signal-to-interference-power ratio, a signal-to-noise-power ratio, and a signal-to-noise-interference-power ratio noise; and

the judging means determines that the equalization by each equalizer is required for the channel condition if the estimated value from the channel state estimating means is more than a predetermined value beforehand set, and determines that the equalization by each equalizer is not required for the channel condition if the estimated value from the channel state estimating means is less than the predetermined value.

5. A mobile communication system in accordance with claim 3, characterized in that:

the channel state estimating means estimates at least one of a multipath number, a multipath interval, and a delay deviation; and

the judging means determines, according to the estimated value from the channel state estimating means, whether the equalization by each equalizer is required for the channel condition.

6. A mobile communication system comprising a wireless apparatus including one or more equalizers for equalizing received signals and multipath timing detecting means for detecting multipath timings in a received signal using a known signal, characterized in that:

the wireless apparatus comprises channel judging means for judging, according to the multipath timings detected by the multipath timing detecting means and based on a multipath state, whether equalization by each equalizer is required for a channel condition; and selecting means for operating each equalizer to equalize the received signals if the judging means determines that the equalization by each equalizer is required for the channel condition, and suppressing the equalization for the received signals if the judging means determines that the equalization by each equalizer is not required for the channel condition.

7. A mobile communication system in accordance with claim 6, characterized in that the channel judging means determines whether equalization by each equalizer is required for the channel condition, according to a criterion whether or not there exist a plurality of the multipaths and whether or not an interval of the multipath is equal to or less than a fixed value.

8. A mobile communication system comprising a wireless apparatus including multipath timing detecting means for detecting multipath timings in a received signal using a known signal and conducting communication using a Code Division Multiple Access (CDMA), characterized in that the wireless apparatus comprises:

channel vector estimating means for estimating channel vectors

according to the multipath timings detected by the multipath timing detecting means; channel matrix generating means for arranging the channel vectors estimated by the channel vector estimating means, in a preset method according to the multipath timings, to thereby generate a Channel matrix; weight calculating means for calculating a filter weight using the Channel matrix generated by the channel matrix generating means, one or more equalizers for equalizing the received signals using the filter weight calculated by the weight calculating means, and finger rake means for conducting ordinary reception according to the multipath timings detected by the multipath timing detecting means.

9. A mobile communication system in accordance with claim 8, characterized in that:

the channel vector estimating means estimates channel vectors of the multipath timings and a number of channel vectors in the neighborhood of the multipath timings; and

the channel matrix generating means generates the Channel matrix using the channel vectors of the multipath timings and the number of channel vectors in the neighborhood of the multipath timings.

10. A mobile communication system comprising a wireless apparatus including one or more equalizers for equalizing received signals and conducting communication using a Code Division Multiple Access (CDMA), characterized in that the wireless apparatus comprises:

channel state estimating means for estimating a channel state according to the received signals, judging means for judging, according to the channel state estimated by the channel state estimating means,

whether or not equalization by each equalizer is required for a channel condition; and selecting means for operating each equalizer to equalize the received signals if the judging means determines that the equalization by each equalizer is required for the channel condition, and making the received signals pass finger rake means to thereby suppress the equalization by each equalizer. .

11.　A mobile communication system in accordance with claim 10, characterized in that:

the channel state estimating means estimates at least one of a signal-to-interference-power ratio, a signal-to-noise-power ratio, and a signal-to-noise-interference-power ratio noise; and

the judging means determines that the equalization by each equalizer is required for the channel condition if the estimated value from the channel state estimating means is more than a predetermined value beforehand set, and determines that the equalization by each equalizer is not required for the channel condition if the estimated value from the channel state estimating means is less than the predetermined value.

12.　A mobile communication system in accordance with claim 10, characterized in that:

the channel state estimating means estimates at least one of a multipath number, a multipath interval, and a delay deviation; and

the judging means determines, according to the estimated value from the channel state estimating means, whether the equalization by each equalizer is required for the channel condition.

13.　A mobile communication system comprising a wireless apparatus including one or more equalizers for equalizing received

signals and multipath timing detecting means for detecting multipath timings in a received signal using a known signal and conducting communication using a Code Division Multiple Access (CDMA), characterized in that:

the wireless apparatus comprises channel judging means for judging, according to the multipath timings detected by the multipath timing detecting means, whether or not equalization by each equalizer is required for a channel condition; and selecting means for operating each equalizer to equalize the received signals if the judging means determines that the equalization by each equalizer is required for the channel condition, and making the received signals pass finger rake means to suppressing the equalization by each equalizer.

14. A mobile communication system comprising a wireless apparatus including one or more equalizers for equalizing received signals and conducting communication using a Code Division Multiple Access (CDMA), characterized in that:

the wireless apparatus comprises channel judging means for judging, according to a criterion that at least the number of codes to be multiplexed is equal to or more than a fixed value, whether or not equalization by each equalizer is required for the channel condition; and selecting means for operating each equalizer to equalize the received signals if the judging means determines that the equalization by each equalizer is required for the channel condition, and making the received signals pass finger rake means to suppressing the equalization by each equalizer.

15. A wireless apparatus including multipath timing detecting means for detecting multipath timings in a received signal using a known signal, characterized by comprising:

channel vector estimating means for estimating channel vectors according to the multipath timings detected by the multipath timing detecting means; channel matrix generating means for arranging the channel vectors estimated by the channel vector estimating means, in a preset method according to the multipath timings, to thereby generate a Channel matrix; weight calculating means for calculating a filter weight using the Channel matrix generated by the channel matrix generating means, and one or more equalizers for equalizing the received signals using the filter weight calculated by the weight calculating means.

16.   A wireless apparatus in accordance with claim 15, characterized in that:

the channel vector estimating means estimates channel vectors at the multipath timings and a number of channel vectors in the neighborhood of the multipath timings; and

the channel matrix generating means generates the Channel matrix using the channel vectors at the multipath timings and the number of channel vectors in the neighborhood of the multipath timings.

17.   A wireless apparatus comprising one or more equalizers for equalizing received signals, characterized by comprising:

channel state estimating means for estimating a channel state according to the received signals, judging means for judging, according to the channel state estimated by the channel state estimating means, whether equalization by each equalizer is required for a channel condition; and selecting means for operating each equalizer to equalize the received signals if the judging means determines that the equalization by each equalizer is required for the channel condition,

and suppressing the equalization for the received signals if the judging means determines that the equalization by each equalizer is not required for the channel condition.

18.   A wireless apparatus in accordance with claim 17, characterized in that:

the channel state estimating means estimates at least one of a signal-to-interference-power ratio, a signal-to-noise-power ratio, and a signal-to-noise-interference-power ratio noise; and

the judging means determines that the equalization by each equalizer is required for the channel condition if the estimated value from the channel state estimating means is more than a predetermined value beforehand set, and determines that the equalization by each equalizer is not required for the channel condition if the estimated value from the channel state estimating means is less than the predetermined value.

19.   A wireless apparatus in accordance with claim 17, characterized in that:

the channel state estimating means estimates at least one of a multipath number, a multipath interval, and a delay deviation; and

the judging means determines, according to the estimated value from the channel state estimating means, whether or not the equalization by each equalizer is required for the channel condition.

20.   A wireless apparatus comprising one or more equalizers for equalizing received signals and multipath timing detecting means for detecting multipath timings in a received signal using a known signal, characterized by comprising:

channel judging means for judging, according to the multipath

timings detected by the multipath timing detecting means and based on a multipath state, whether or not equalization by each equalizer is required for a channel condition; and selecting means for operating each equalizer to equalize the received signals if the judging means determines that the equalization by each equalizer is required for the channel condition, and suppressing the equalization for the received signals if the judging means determines that the equalization by each equalizer is not required for the channel condition.

21. A wireless apparatus in accordance with claim 20, characterized in that the channel judging means determines whether or not equalization by each equalizer is required for the channel condition, according to a criterion whether or not there exist a plurality of multipaths and whether or not an interval of the multipath is equal to or less than a fixed value.

22. A wireless apparatus comprising multipath timing detecting means for detecting multipath timings in a received signal using a known signal and conducting communication using a Code Division Multiple Access (CDMA), characterized by comprising:

channel vector estimating means for estimating channel vectors according to the multipath timings detected by the multipath timing detecting means; channel matrix generating means for arranging the channel vectors estimated by the channel vector estimating means, in a preset method according to the multipath timings, to thereby generate a Channel matrix; weight calculating means for calculating a filter weight using the Channel matrix generated by the channel matrix generating means, one or more equalizers for equalizing the received signals using the filter weight calculated by the weight calculating means, and finger rake means for conducting ordinary

reception according to the multipath timings detected by the multipath timing detecting means.

23. A wireless apparatus in accordance with claim 22, characterized in that:

the channel vector estimating means estimates channel vectors of the multipath timings and a number of channel vectors in the neighborhood of the multipath timings; and

the channel matrix generating means generates the Channel matrix using the channel vectors of the multipath timings and the number of channel vectors in the neighborhood of the multipath timings.

24. A wireless apparatus comprising one or more equalizers for equalizing received signals and conducting communication using a Code Division Multiple Access (CDMA), characterized by comprising:

channel state estimating means for estimating a channel state according to the received signals, judging means for judging, according to the channel state estimated by the channel state estimating means, whether or not equalization by each equalizer is required for a channel condition; and selecting means for operating each equalizer to equalize the received signals if the judging means determines that the equalization by each equalizer is required for the channel condition, and making the received signals pass finger rake means to thereby suppress the equalization by each equalizer.

25. A wireless apparatus in accordance with claim 24, characterized in that:

the channel state estimating means estimates at least one of a signal-to-interference-power ratio, a signal-to-noise-power ratio, and a

signal-to-noise-interference-power ratio noise; and

the judging means determines that the equalization by each equalizer is required for the channel condition if the estimated value from the channel state estimating means is more than a predetermined value beforehand set, and determines that the equalization by each equalizer is not required for the channel condition if the estimated value from the channel state estimating means is less than the predetermined value.

26. A wireless apparatus in accordance with claim 24, characterized in that:

the channel state estimating means estimates at least one of a multipath number, a multipath interval, and a delay deviation; and

the judging means determines, according to the estimated value from the channel state estimating means, whether or not the equalization by each equalizer is required for the channel condition.

27. A wireless apparatus comprising one or more equalizers for equalizing received signals and multipath timing detecting means for detecting multipath timings in a received signal using a known signal and conducting communication using a Code Division Multiple Access (CDMA), characterized by comprising:

channel judging means for judging, according to the multipath timings detected by the multipath timing detecting means, whether or not equalization by each equalizer is required for a channel condition; and selecting means for operating each equalizer to equalize the received signals if the judging means determines that the equalization by each equalizer is required for the channel condition, and making the received signals pass finger rake means to suppressing the equalization by each equalizer.

28.   A wireless apparatus comprising one or more equalizers for equalizing received signals and conducting communication using a Code Division Multiple Access (CDMA), characterized by comprising:

channel judging means for judging, according to a criterion that at least the number of codes to be multiplexed is equal to or more than a fixed value, whether or not equalization by each equalizer is required for a channel condition; and selecting means for operating each equalizer to equalize the received signals if the judging means determines that the equalization by each equalizer is required for the channel condition, and making the received signals pass finger rake means to suppressing the equalization by each equalizer.